Register of Australian Grain Legume Cultivars

Phaseolus vulgaris (L.) (navy bean) cv. Spearfelt

Reg. No. ARGL 93-1

Registered 22 March 1993

Originator: R. J. Redden
Queensland Department of Primary Industries,
GPO Box 46, Brisbane, Qld 4001, Australia.

Registrar: R. L. Gammie
NSW Agriculture, Division of Plant Industries,
Locked Bag 21, Orange, NSW 2800, Australia.

Released by Queensland Department of Primary Industries.

Australian Journal of Experimental Agriculture, 1996, **36**, 631–2.

Origin

Spearfelt was selected as a navy bean type under the code CH187-2D. Its parents, Campbell 11 from USA, and CH33-8D, a local selection, were crossed in 1985. Spearfelt has been evaluated in 19 trials in Queensland from 1988 to 1992 for yield, agronomic and disease characters, with concurrent canning tests at H. J. Heinz Co., Dandenong, Victoria, and more recently at both SPC Shepparton and Edgell–Bird's Eye (both Bathurst and Manly branches), Division of Petersville Industries Ltd (now Simplot). Trials were conducted by R. Redden, T. Usher, W. Tompkins, D. Lack, J. Hardy and B. Whitting, while R. Wright assisted in the production of quarantine status disease-free seed. Sites used were Hermitage (via Warwick), Kingsthorpe, Biloela, Kingaroy (Taabinga and Redvale), and Southedge (via Mareeba) Research Stations. On-farm experimental trials occurred at Kumbia and Biloela, and commercial-scale test strips were evaluated in 1992 at Kingaroy, Laidley and Biloela. Protection under plant variety rights has been sought for Spearfelt.

Morphological description

Comparative plant characteristics of Spearfelt and the old (Actolac, Gallaroy) and the new (Sirius, Rainbird) industry cultivars are given in Table 1.

Spearfelt has a highly determinate, erect growth habit with an average height of 47 cm. It is more erect and lodging resistant than Actolac, Gallaroy, Sirius and Rainbird. Branching is very compact and pods are widely distributed on both the main stem and branches. Leaves are of medium size, elongated rhomboid in shape and medium green in colour. Flowers are white with small calyx's. Pods are green and medium length, and do not contain anthocyanin pigmentation before maturity. Seeds are small and white, with a 100-seed weight of 18.7 g. This is slightly smaller than the old standards Gallaroy and Actolac, and also smaller than the new cultivars Rainbird and Sirius.

Yield and agronomic characteristics

Spearfelt showed a 44% yield advantage over Actolac in the 19 trials, with yields significantly better in 9 trials. In 15 trials, its yields were 7% below Sirius and 11% above Rainbird. Spearfelt out-yielded Rainbird in 3/15 trials and was inferior to Sirius in 2/15 trials.

Spearfelt flowered at a similar time to Rainbird, 3–4 days later than Actolac and Gallaroy in 18/19 trials. It matured 5 days later than Actolac, but 1 and 2 days earlier than Rainbird and Sirius, respectively.

Average canopy height of Spearfelt is 4 cm greater than Actolac, but it is shorter than Rainbird and Sirius. Spearfelt is superior for resistance to lodging, showing a mean of 21% for lodging in 17 trials compared with 29% for Actolac, 30% for Rainbird and 38% for Sirius. Spearfelt had significantly less lodging than Actolac in 6/17 trials and Sirius in 6/13 trials.

Spearfelt is highly determinate with a vining score of only 1.1 *v.* 1.3 for Actolac, 1.5 for Rainbird and 3.0 for Sirius. Lower pod height at harvest for Spearfelt is similar to that of Sirius and Rainbird, all of which exceed Actolac.

Comparative disease resistance characteristics of the 5 navy bean cultivars are shown in Table 2. Spearfelt is resistant to the prevalent races of rust although small pustules were observed in the field. It has a similar susceptibility to common bacterial

Table 1. Comparative plant characteristics of cvv. Spearfelt, Actolac, Gallaroy, Rainbird and Sirius

Values are means over all sites
The number of trials for each cultivar is in parentheses
Vining tendency is rated 1–5 from low to high expression

Cultivar	Yield (kg/ha)	Yield (% of Actolac)	Flowering (days)	Maturity (days)	Height Plant (cm)	Height Pod (cm)	Seed weight (g/100 seeds)	Lodging (%)	Vining tendency
Spearfelt	1597 (19)	144	44 (18)	78 (7)	45 (16)	6.6 (18)	18.7 (5)	21 (17)	1.1 (16)
Actolac	1234 (19)	100	41 (18)	73 (7)	41 (16)	5.8 (18)	20.0 (15)	29 (17)	1.3 (16)
Gallaroy	1325 (15)	—	39 (14)	73 (7)	40 (12)	4.8 (14)	19.5 (4)	34 (13)	1.4 (13)
Rainbird	1503 (15)	120	43 (14)	79 (7)	52 (12)	6.4 (14)	21.5 (4)	30 (13)	1.5 (13)
Sirius	1790 (15)	152	45 (14)	80 (7)	47 (12)	6.7 (14)	20.5 (4)	38 (13)	3.0 (13)

Table 2. Disease resistance and canning quality of Spearfelt compared with the named cultivars

Values are means over all sites
The number of trials for each cultivar is in parentheses
Susceptibility to peanut mottle virus (PMV) is rated 1–5 from low to high
Susceptibility to rust and bacterial blight, and sensitivity to zinc deficiency are rated 1–9 from low to high
Canning quality is a mean sensory rating from 1 (poor) to 5 (good) over 4 years and 2 crop management systems (irrigated and rainfed)

Cultivar	Zinc sensitivity	Bacterial blight	Rust	PMV inoculated	Canning quality
Spearfelt	2.6 (4)	4.0 (14)	1.0 (8)	4.2	2.9
Actolac	2.9 (4)	4.9 (14)	1.8 (8)	2.0	1.4
Gallaroy	5.5 (2)	4.8 (11)	5.5 (5)	2.0	3.1
Rainbird	3.0 (2)	5.2 (11)	1.3 (5)	1.2	2.5
Sirius	2.3 (2)	4.1 (11)	1.0 (5)	4.8	2.8

blight as Actolac, being significantly more susceptible in 1/14 trials and more resistant in 3/14 trials. It was more susceptible than Sirius in 6 trials.

Spearfelt is less sensitive to zinc deficiency than Gallaroy, Actolac and Rainbird.

Economic value

Spearfelt has shown acceptable to good canning quality at the Heinz, Watties and Edgell–Bird's Eye factories, however, it failed 1 canning test at SPC. Over a 4-year period, Spearfelt has consistently shown good to excellent canning quality (Table 2), especially from irrigated trials.

Spearfelt would be very useful to growers for 1-pass direct harvesting without windrowing in new production areas because of its outstanding erect habit. This erect habit also provides some escape from sclerotinia, especially if grown in rows. Spearfelt is equally suited to solid drilling in conjunction with direct harvesting. The erect plant habit offers a range of management options to growers but its susceptibility to peanut mottle virus (Table 2) means that Spearfelt should not be grown in peanut areas.